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FURTHER OBSERVATIONS ON COULTER'S WHITEFISH

(*Coregonus coulteri*. Eigenmann.)

In *Copeia*, June 24, 1917, No. 45, I called attention to "A Second Record for the Coulter's Whitefish," and presented some notes comprising proportional measurements, etc.

In the same publication, issue of October 26, 1917, No. 50, p. 93, Professor J. O. Snyder called attention to a prior "second record" which he had published in proceedings of the U. S. National Museum, XXXVI, page 430. So, my second record was really the third, and unless I have overlooked other references the present notice constitutes the fourth record.

The fish to which Professor Snyder referred were collected June, 1894, in Diamond Lake, Stevens County, Washington, the lake being in the Columbia basin. Professor Snyder stated that some of them were 127 mm. in length and appeared to be fish of the year, and suggested that adults of the species may reach a much larger size, and that it is not impossible that the species may be a deep water form of some food value.

In my "Second Record" I neglected to state that the fish, which were collected in Alaska, November 1, 1912, ranging in length from 150 to 158 mm. were mature individuals ready to spawn.

Three of Eigenmann's cotypes from Kicking Horse River, Field, B. C., collected probably in September,

comprise 2 mature males 110 and 92 mm. long respectively and 1 mature female 100 mm. long. The spermaries and ovaries are well advanced, indicating that they would have spawned that year.

The present notes pertain to two collections from Lake Aleknagik, Alaska. One comprises 4 specimens taken July 20, 1909, by M. C. Marsh. The second comprises 5 specimens taken by G. Dallas Hanna, August 2, 1912. The fish were said to be passing out of the lake in large numbers. Doubtless it was the spawning run for all of the fish; 3 females and 2 males were in breeding condition. These fish ranged from 148 to 197 mm. total length.

Marsh's collection comprised 3 females and 1 male ranging in total length from 165 to 180 mm. In the matter of size and value as food Prof. Snyder's suggestion seems to be something of a fulfilled prophecy.

The fish are as large as the average smelt (*Osmerus mordax*). They closely resemble the round whitefish or menominee (*Coregonus quadrilateralis*). The most striking superficial difference is rounded or blunt muzzle and conspicuously large scales. I strongly suspect that this species may have been comprised in other collections and confused with the round whitefish.

In fact I believe that the figure of the head of "*Coregonus quadrilateralis*," from Port Halkett, shown by Gunther (Cat. VI, p. 176) may be this species. There appear to be two Port Halketts, one in British Columbia, the other at the mouth of the McKenzie River, possibly the latter should be read "Fort" Halkett.

The specimens of Hanna's collection are bright silvery on the sides and show no trace of dark spots, but each of 4 of the Marsh lot has a series of about a dozen roundish black spots the size of the eye along the side immediately above and touching the lateral line. These spots are more vertically oblong forward than posteriorly. They probably represent parr marks which were brought out by preservation in formalin.

The stomach of specimens in Marsh's collection contained no food, excepting a little fine indetermin-

able mush. The stomachs of all but one of Hanna's fish contained small eggs of some salmonid. These were about the size of brook trout (*S. fontinalis*) eggs. One fish contained 1, another 7 and 2 others 18 each.

Detailed measurements to six female and three male Coulter's Whitefish follow. The former measure 175 to 198 mm. in total length. 150 to 174 mm. in length to base of caudal. The latter measure 159 to 182 in total length; 135 to 152 in length to base of caudal; measurements in percentage of length to base of caudal are as follows:—

Distance from tip of snout to nape, decreasing with size, 15.00 to 16.15, females; 15.15 to 16.30, males. Distance from nape to front of dorsal 29.10 to 31.20, females; 29.00 to 31.00, males. Length of base of dorsal 11.60 to 12.95, females; 11.90 to 12.50, males. Length of longest dorsal ray (decreasing with size in the females) 12.50 to 14.85, females; 14.30 to 14.80, males. Distance from posterior base dorsal to adipose 24.60 to 27.55, females; 25.00 to 25.60, males. Length of base of adipose 4.70 to 6.00, females; 4.61 to 6.45, males. Distance posterior base of adipose to base of upper caudal lobe 10.70 to 11.70, female; 9.63 to 12.50, males. Length of upper caudal lobe, 18.15 to 22.00, females; 19.80 to 23.00, males. Length of longest upper caudal ray 14.20 to 16.80, females; 16.50 to 17.20, males. Length of tail (6.65?) 8.11 to 9.03, females; 7.90 to 10.00, males. Length of middle ray of caudal 4.82 to 6.45, females; 4.61 to 6.65, males. Length of lower caudal lobe 18.10 to 21.30, females; 21.70 to 22.90, males. Length of longest caudal ray, 15.50 to 16.80, females; 17.15 to 17.20, males. Least depth caudal peduncle 6.31 to 7.00, females; 6.57 to 7.13, males. Distance from tip of snout to base of pectoral 18.15 to 21.90, females; 20.70 to 21.50, males. Length of longest pectoral ray (decreasing with size in female) 13.80 to 16.05, females; 16.30 to 16.80, males. Distance from base of pectoral to base of ventral 29.10 to 31.60, females; 29.60 to 31.20, males. Length of longest ventral ray 12.50 to 14.00, females;

14.85 to 15.45, males. Distance from base of ventral to front of anal 23.00 to 25.20, females; 21.50 to 24.70, males. Length of base of anal 9.67 to 11.30, females; 10.70 to 11.20, males. Length of longest anal ray 12.00 to 19.40, females; 14.10 to 14.50, males. Distance from posterior base of anal to base of lower caudal lobe 12.70 to 19.40, females; 12.90 to 14.50, males. Length of head 19.40 to 21.30, females; 21.10 to 21.15 (21.42?), males. Depth of body 16.78 to 18.75, females; 17.10 to 18.45, males.

The following measurements are in percentage of length of head. Depth head through eye 40.5 to 47.1 females; 40.6 to 45, males. Width of interorbital space 25.00 to 29.1, females; 24.6 to 26.68, males. Distance from tip of snout to posterior edge of preopercle 66.7 to 74.2, females; 68.7 to 73.3, males. Vertical diameter of eye 17.6 to 24.2, females; 18.75 to 22.8, males. Longitudinal diameter of the eye 20.3 to 26.5, females; 21.66 to 24.6, males. Length of maxillary bone 15.1 to 22.6, females; 21.9 to 22.8, males. Width of maxillary bone 8.85 to 9.65, females; 9.40 to 10.50, males. Length of supplementary maxillary 11.30 (one female); 12.5 to 14.55, (two males). Width of supplementary maxillary 6.43 (one female); 3.91 to 4.4, (two males). Length of mandible 30.4 to 34.4, females; 31.3 to 35.2, males.

The number of rays are as follows. Branchiostegals $\frac{7 \text{ to } 8}{7 \text{ to } 8}$, females; $\frac{7 \text{ to } 7}{7 \text{ to } 8}$, males. Dorsal rays $\frac{3 \text{ to } 4}{8 \text{ to } 10\frac{1}{2}}$, females; $\frac{3 \text{ to } 4}{8 \text{ to } 9}$, males. Anal rays $\frac{3}{8\frac{1}{2} \text{ to } 9\frac{1}{2}}$, females; $\frac{3 \text{ to } 4}{8\frac{1}{2} \text{ to } 9\frac{1}{2}}$, males. Pectoral rays 14 to 15. Scale counts are as follows:—longitudinal series above lateral line (64?) 68 to 70 plus 3 to 5, females; 70 to 75 plus 3, males. From front of dorsal to and including lateral line 7 to 8, females, 7 males; from lateral line to front of ventral 6; in front of dorsal 21 to 25 females, 22 to 25 males; below dorsal 9 to 10; from posterior base of dorsal to adipose 18 to 22 females, 20 to 22 males.

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